

# FINE-FREQUENCY OFFSET ESTIMATION

## ABSTRACT

Orthogonal frequency division multiplexing (OFDM) receiver embodiments of the invention demodulate quadrature amplitude modulated (QAM) signals transmitted in the five GHz frequency band and digitally correct for frequency offset errors in their digital signal processing (DSP) units. A method comprises a step in which an OFDM transmission is I/Q sampled and a portion of the received packet is selected. It is assumed that the coarse frequency offset has been estimated and that the remaining frequency offset after coarse frequency offset compensation does not exceed  $\pm 10$  kHz (valid for 802.11a PHY implementation only). It is also assumed that a timing reference has been determined. A cost function is used to determine a fine-frequency offset. Once the fine frequency offset is determined, the estimate is used in the downstream digital signal processing.